

CLAIMS

1. A manufacturing method of a thin component, including the steps of heating a thin component (1), and thereafter, while sizing with molds (12a, 12b) and using said molds (12a, 12b) as cooling media of said thin component (1), performing one of quenching and isothermal transformation processes on said thin component (1).

2. The manufacturing method of a thin component according to claim 1, wherein said step of sizing said thin component (1) with said molds (12a, 12b) includes the step of pressing said thin component (1) with said molds (12a, 12b).

3. The manufacturing method of a thin component according to claim 1, wherein said quenching of said thin component (1) is performed using said molds (12a, 12b) as quenching media.

4. The manufacturing method of a thin component according to claim 1, wherein said molds (12a, 12b) have cooling means, and said thin component (1) can continuously be quenched by said molds (12a, 12b).

5. The manufacturing method of a thin component according to claim 1, wherein said thin component (1) is quenched in an atmosphere in which oxidation of said thin component (1) is prevented.

6. The manufacturing method of a thin component according to claim 1,
wherein
after said thin component (1) is quenched, said thin component (1) is tempered
using said molds (12a, 12b) as temperature controlling media.

7. The manufacturing method of a thin component according to claim 6,
wherein
said molds (12a, 12b) are used in both of said steps of quenching and tempering
said thin component (1).

8. The manufacturing method of a thin component according to claim 1,
wherein
in said step of quenching said thin component (1), a molding process of said thin
component (1) using said molds (12a, 12b) is concurrently performed.

9. The manufacturing method of a thin component according to claim 1,
wherein
said heating of said thin component (1) is performed by induction heating.

10. The manufacturing method of a thin component according to claim 1,
wherein
a material of said thin component (1) is steel containing carbon by at least 0.4
mass %.

11. A bearing ring, wherein said bearing ring is manufactured by the method
according to claim 1.

12. A thrust needle roller bearing, wherein said bearing ring (1) according to
claim 11 is used.

13. A manufacturing method of a rolling bearing ring, comprising the step of,
after heating a rolling bearing ring as said thin component (1) using the
manufacturing method of a thin component (1) according to claim 1, by cooling said
rolling bearing ring while pressing with said molds (12a, 12b) and using said molds (12a,
5 12b) as quenching media, quenching said rolling bearing ring.

14. The manufacturing method of a rolling bearing ring according to claim 13,
wherein
said heating of said rolling bearing ring (1) is performed by induction heating.

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15. The manufacturing method of a rolling bearing ring according to claim 13,
wherein
said rolling bearing ring (1) is mid-carbon steel containing carbon by at least 0.4
mass %.

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16. The manufacturing method of a rolling bearing ring according to claim 13,
wherein
in said quenching, a pressing pressure by said molds (12a, 12b) is at least 2.94
N/cm².

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17. A rolling bearing ring, wherein said rolling bearing ring is manufactured by
the method according to claim 13.

18. A rolling bearing, comprising said rolling bearing ring (1) according to
25 claim 17 and a rolling element (2).

19. The rolling bearing according to claim 18, wherein said rolling bearing is a
thrust needle roller bearing.